FIG. 1

```
┌─────────────────────────────────────────────────┐
│ RECEIVE PRE-PROCESS METROLOGY DATA                │──── 210
│ AND DEFINE AN INPUT STATE FOR A SUBSTRATE         │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│   DETERMINE A DESIRED STATE FOR THE SUBSTRATE     │──── 215
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│        DETERMINE A DESIRED PROCESS RESULT         │──── 220
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│            DETERMINE A PROCESS RECIPE             │──── 225
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│             PROCESS THE SUBSTRATE                 │──── 230
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ RECEIVE POST-PROCESS METROLOGY DATA               │──── 235
│ AND DEFINE AN OUTPUT STATE FOR A SUBSTRATE        │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│ COMPARE POST-PROCESS METROLOGY DATA               │──── 240
│ AND PRE-PROCESS METROLOGY DATA                    │
└─────────────────────────────────────────────────┘
                        │
                        ▼
                ┌──────────────┐
                │   PROCESS     │──── 245
                │  COMPLETED?   │
                └──────────────┘
                        │
                        ▼
                ┌──────────────┐
                │     END      │──── 250
                └──────────────┘
```

200

FIG. 2

MEASURED CD

TARGET CD

TRIM AMOUNT

TARGET CD + TOLERANCE

TARGET CD - TOLERANCE
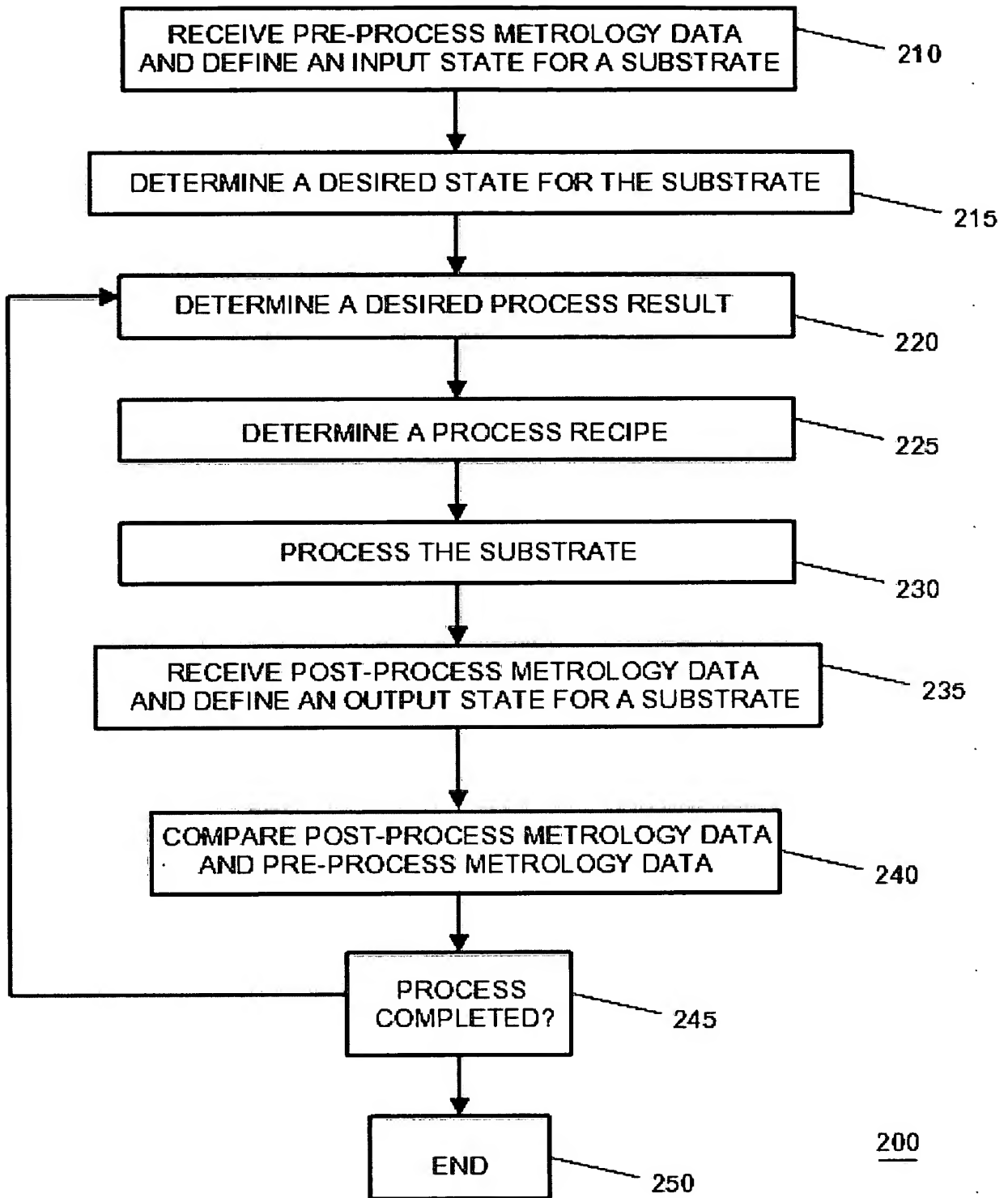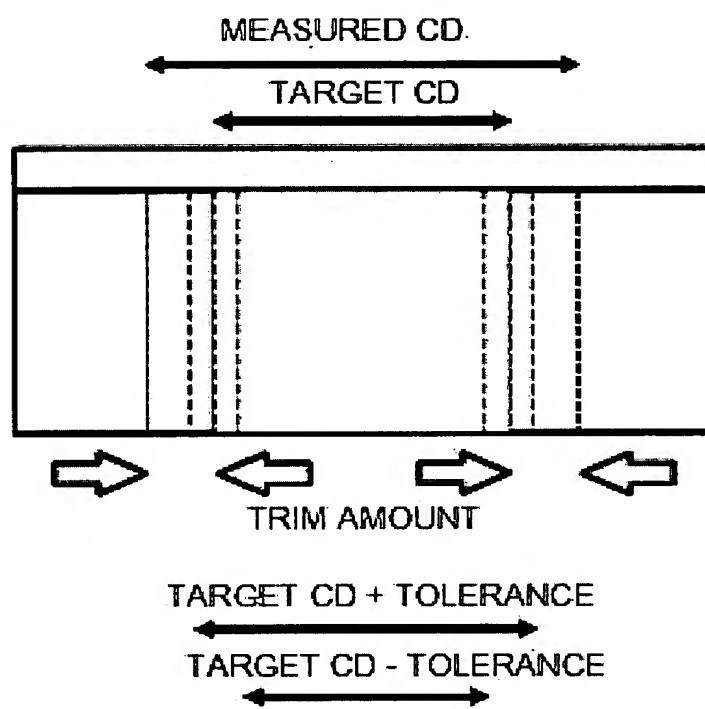
FIG. 3

TA DENOTES TRIM AMOUNT
TA-LB DENOTES TRIM AMOUNT LOWER BOUNDRY
TA-UB DENOTES TRIM AMOUNT UPPER BOUNDRY
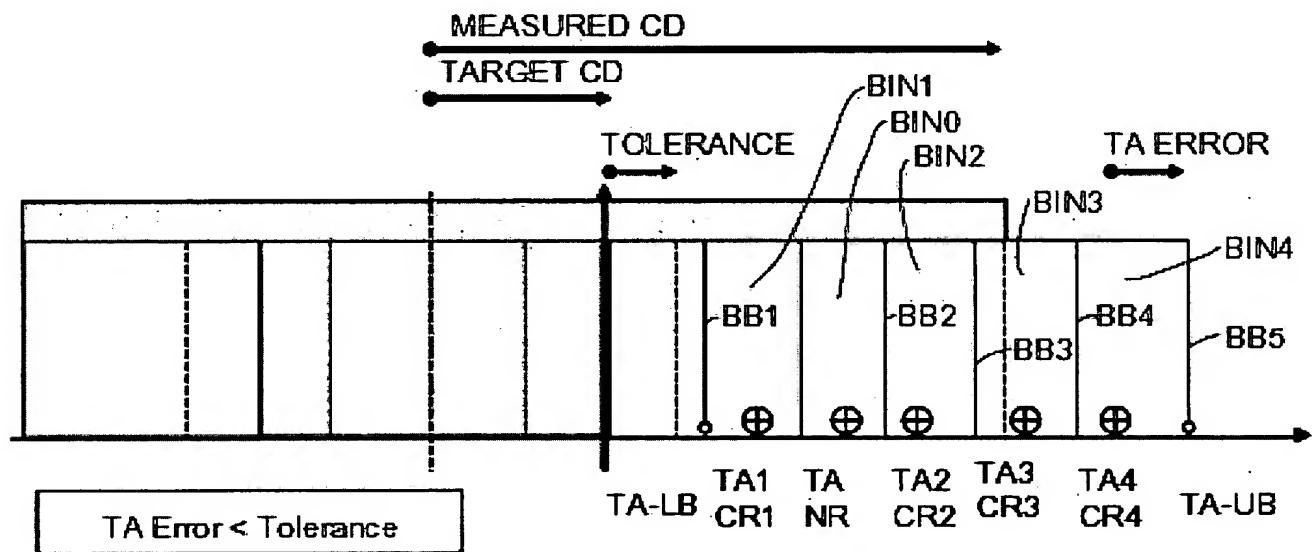CR DENOTES CONTROL RECIPE
NR DENOTES NOMINAL RECIPE

MEASURED CD
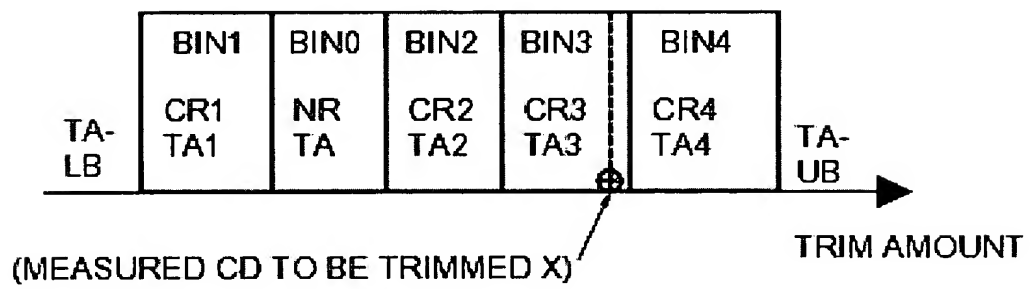
TARGET CD

TOLERANCE

BIN1
BIN0
BIN2

TA ERROR

BIN3

BIN4

BB1   BB2   BB4

BB3   BB5

TA-LB   TA1   TA   TA2   TA3   TA4   TA-UB
         CR1   NR   CR2   CR3   CR4

TA Error < Tolerance

FIG. 4

	BIN1	BIN0	BIN2	BIN3	BIN4	
TA-LB	CR1 TA1	NR TA	CR2 TA2	CR3 TA3	CR4 TA4	TA-UB

(MEASURED CD TO BE TRIMMED X)

TRIM AMOUNT

FIG. 5

TEL R2R Controller

Recipe Range

Inachito

Selection

```
+PM01
  [*]KINO
  [*]MochiVL01
  NAKA
+PM02
  KINO-TEST1
  VL1
```

Recipe Range

Name   KINO-TEST1   ☐ Protection

Description

Control	Variable [Unit]	Lower Limit	Upper Limit	Description
yes	StepProcTime [sec]	0:0.0	16:40.0	
yes	ChamberPres [mT]	0.0	100.0	
yes	GAS1 [sccm]	0.0	50.0	NH3
yes	GAS2 [sccm]	0.0	50.0	HF
yes	GAS3 [sccm]	0.0	50.0	HF
yes	GAS4 [sccm]	0.0	50.0	HF
yes	GAS5 [sccm]	0.0	50.0	
yes	GAS6 [sccm]	0.0	50.0	
yes	GAS7 [sccm]	0.0	50.0	
yes	GAS8 [sccm]	0.0	50.0	
no	GAS9 [sccm]	0.0	50.0	
no	GAS10 [sccm]	0.0	50.0	
no	GAS11 [sccm]	0.0	50.0	
no	GAS12 [sccm]	0.0	50.0	

Reset   OK   Save   Cancel

| Close | New | Copy | Edit | Delete | | | |

FIG. 6

FIG. 7

FIG. 8
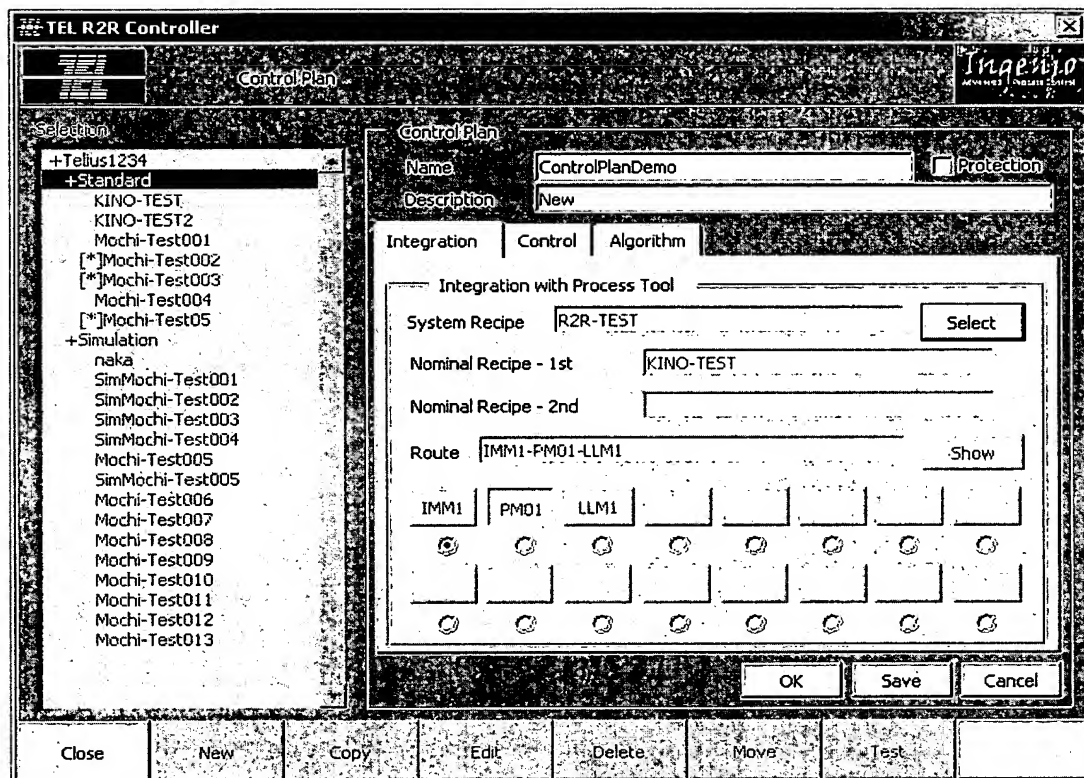
FIG. 9A
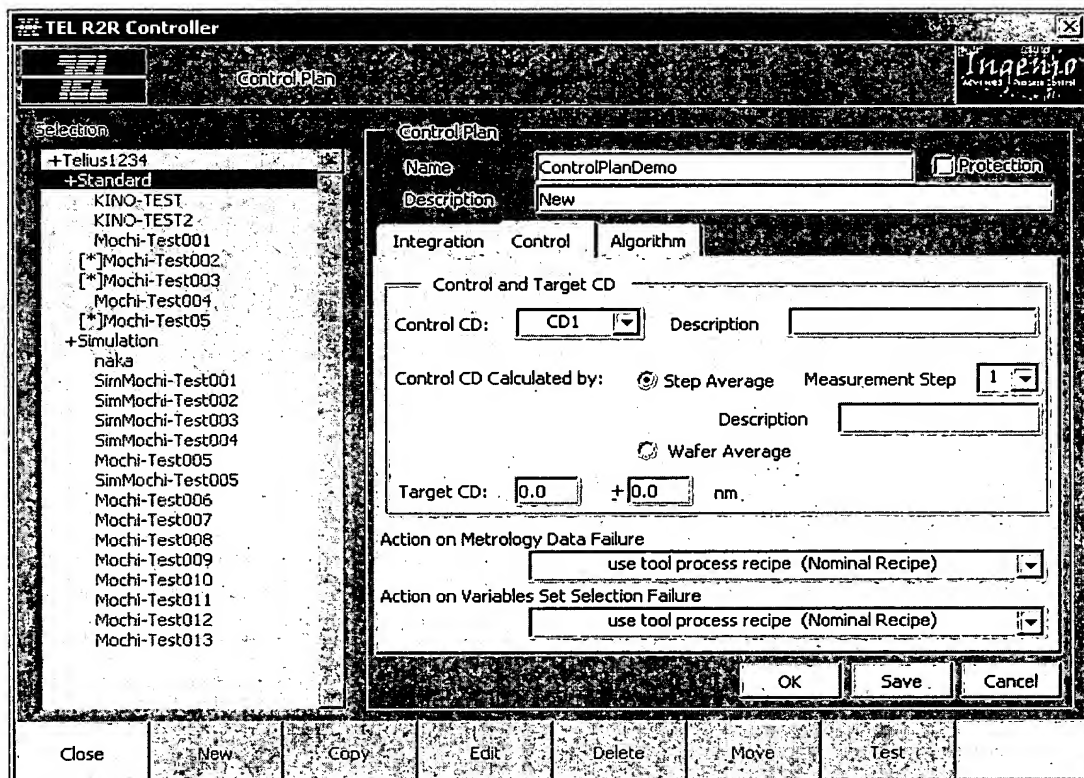
FIG. 9B
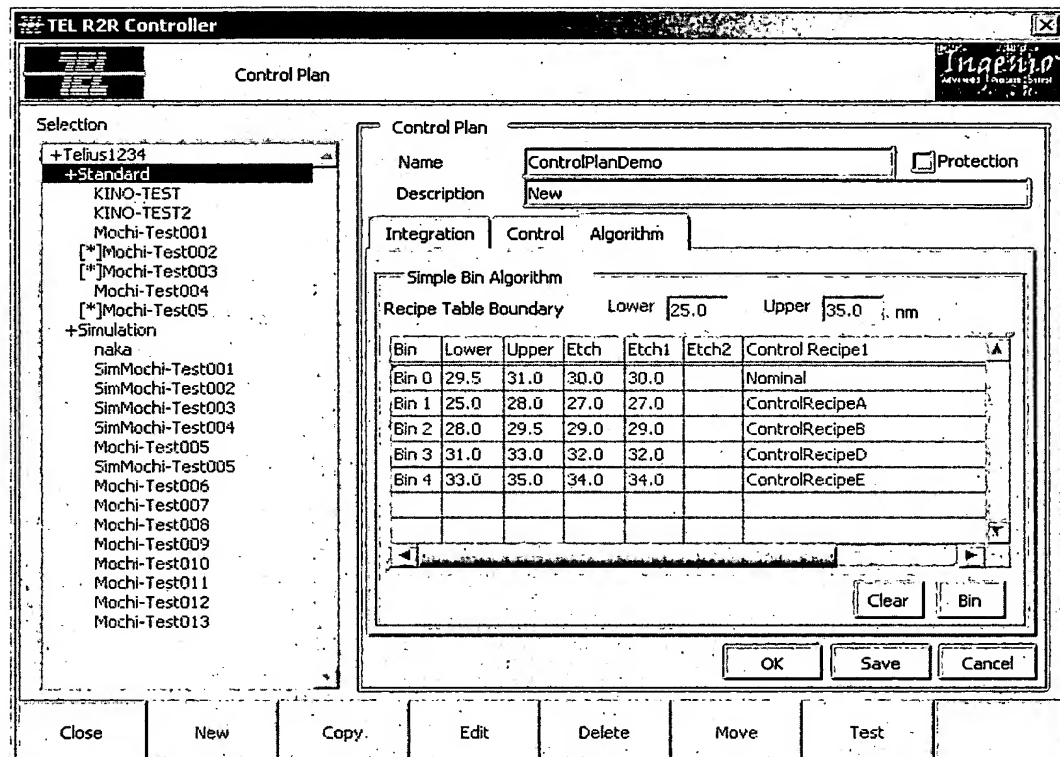
FIG. 9C

Binning Table ☒

Etch Amount(nm) Input for each Control Recipe

Recipe Range   [RecipeRangeDemo]   [Select]

Bin Table Boundary   Lower [25.0]   Upper [35.0]   [nm]

Control Recipe 1	Control Recipe 2	Etch 1	Etch 2	Etch	▲
Nominal		30.0		30.0	
ControlRecipeA		27.0		27.0	
ControlRecipeB		29.0		29.0	
ControlRecipeD		32.0		32.0	
ControlRecipeE		34.0		34.0	
					▼

(Control Recipe will automatically be selected by the input etch amount)

[Select]   [Delete]

Control Recipe Viewer

Description   [ ]

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	▲
StepProcTime [sec]	2:30.0							
ChamberPres [mT]		500.0						
GAS1 [sccm]		10.0						
GAS2 [sccm]		40.0						
GAS3 [sccm]								▼

[OK]   [Cancel]

FIG. 10

FIG. 11
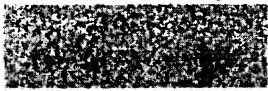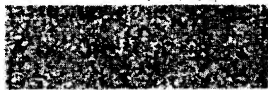
File   Edit   View   Configure

PM01:	Telius_COR		PM02:	Telius_DRM
Run ID:	20030702-0006-PM01-telatapows01		Run ID:	20030703-0220-PM02-telatapows01
DC:	DefaultPlanPM01		DC:	DefaultPlanPM02

VIP:
OES:

Idle for 10:29:01   VIP:
OES:
Error

LLM1:	Telius_PHT
Run ID:	20030702-0006-LLM1-telatapows01
DC:	DefaultPlanLLM1

VIP:
OES:

IMM1:	Telius_ODP
Run ID:	20030702-0006-IMM1-telatapows01
DC:	DefaultPlanIMM1

VIP:
OES:

2003-07-02 22:17:43.421002 Software A connection was successfully established with the tool agent.
2003-07-02 22:16:30.406002 Software The Ingenio Loader encountered SQLSTATE 22007 while inserting data into the persistent database.
2003-07-02 21:43:01.609002 Software A connection was successfully established with the tool agent.

| Tool ID: telatapows01 | Tool Connection: Connected | Screen:Tool Status | User: service@Service Operation |

FIG. 12

File Edit View Configure   Help   `Ingenio`

Tool Name: telatapcws01 ▼ IPAddress: 172.23.23.75   Root Directory: E:/APCData

Module: PM01	Module: LLM1	Module: PM02
Type: Telius_COR	Type: Telius_PHT	Type: Telius_DRM

Module: PM01 — Type: Telius_COR

Sensors
- Sensor: Setpoints_Telius_COR_Etcher enabled
- Sensor: Maintenance_Counters_TEL_Etcher enabled
- Maintenance Counters
  - MC: RF_HOURS
- Gas Parameters
- Pause: PauseCounter 3, ModulePause Disabled, Pause

Module: LLM1 — Type: Telius_PHT

Sensors
- Maintenance Counters
  - MC: RF_HOURS
- Pause

Module: PM02 — Type: Telius_DRM

Sensors
- Sensor: EPD_Telius_Etcher enabled
- Sensor: IEPD_Telius_Etcher enabled
- Sensor: Setpoints_Telius_DRM_Etcher
- Sensor: Maintenance_Counters_TEL_E
- Sensor: EPD_Timer_TEL_Etcher enable
- Sensor: OES_Verity enabled
- Maintenance Counters

Tool: telatapcws01
- Module: PM01
  - DCP: DefaultPM01 enabled recipe_id like '%'
  - Strategy: Auto_SPC enabled recipe_id like 'PROD.%'
    - SPC: auto_template enabled Template SPC plan

Tool: telatapcws01
- Module: LLM1
  - DCP: DefaultLLM1 enabled recipe_id like '%'
  - Strategy: Auto_SPC enabled recipe_id like 'PROD.%'

Tool: telatapcws01
- Module: PM02
  - DCP: DefaultPM02 enabled recipe_i
  - Strategy: Auto_SPC disabled recipe_

2003-07-02 22:17:43.421002 Software A connection was successfully established with the tool agent.
2003-07-02 22:16:30.406002 Software The Ingenio Loader encountered SQLSTATE 22007 while inserting data into the persistent database.
2003-07-02 21:43:01.609002 Software A connection was successfully established with the tool agent.

| Tool ID: telatapcws01 | Tool Connection: Connected | Screen: Module Configuration | User: service@Service Operation | 2003-07-04 07:08:00 |

FIG. 13

File Edit View Configure   Help   TEL Ingenio

Tool: telatapcws01
Module: LLM1
  Sensors
    Maintenance Counters
      Pause
    DCP: DefaultLLM1 enabled recipe
    Strategy: Auto_SPC enabled recip

Data Collection Strategy | Data Collection Plan | Parameter Summary | Step Trimming

Plan Name: DefaultPlanLLM1   Lasted Used: 2003-03-24 19:09:37

Description: auto-generated by Ingenio server

☑ Etch_chamber_Tellus_PHT

#	Parameter

#	Selected
1	APC
2	N2_GAS_FLOW
3	PRESSURE
4	STAGE_TEMP
5	STEP
6	UPPER_TEMP
7	WALL_TEMP

● Unassociated

Being Edited By:

2003-07-02 22:17:43.421002 Software A connection was successfully established with the tool agent.
2003-07-02 22:16:30.406002 Software The Ingenio Loader encountered SQLSTATE 22007 while inserting data into the persistent database.
2003-07-02 21:43:01.609002 Software A connection was successfully established with the tool agent.

| Tool ID: telatapcws01 | Tool Connection: Connected | Screen:PM01 Module Details | User: service@Service Operation | 2003-07-04 07:26:10 |

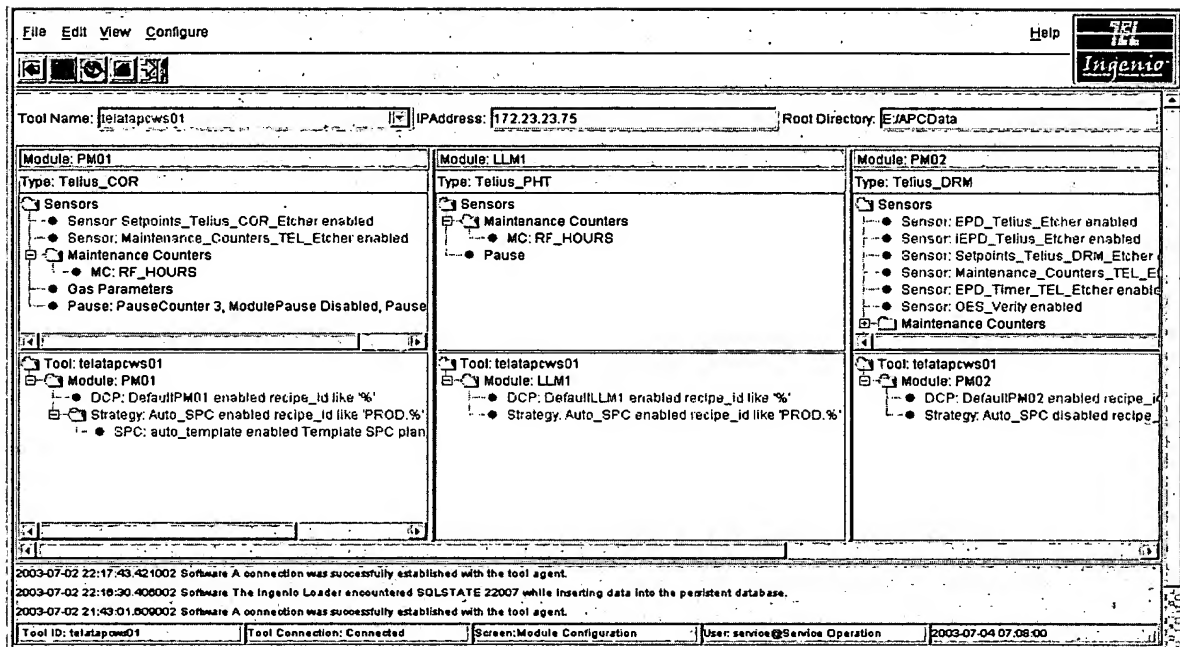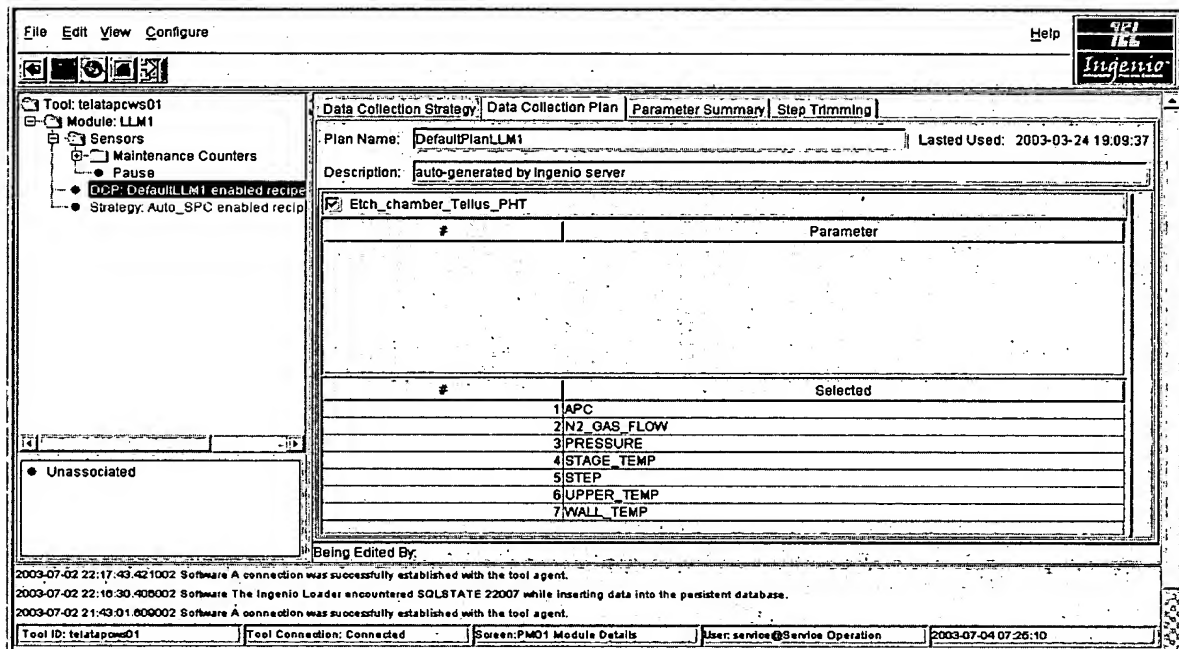FIG. 14
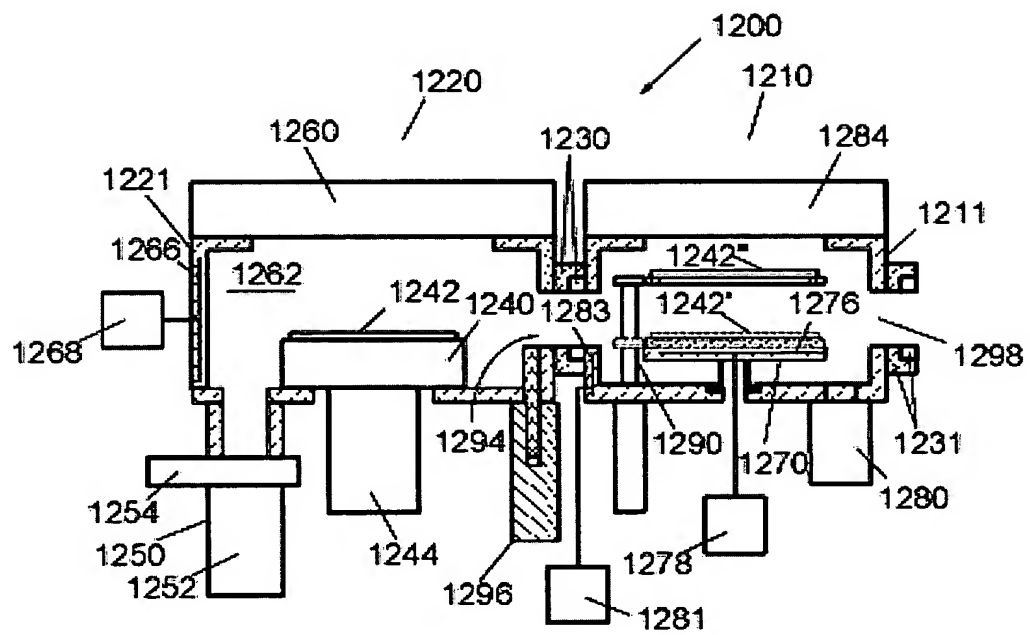
FIG. 15

FIG. 16

FIG. 17

1422

1440 1446   1430

1424
1426
1428

1442 1448 1442   1444   1442 1432

FIG. 18